

Highly Stable, Large Format EUV Imager, Phase I

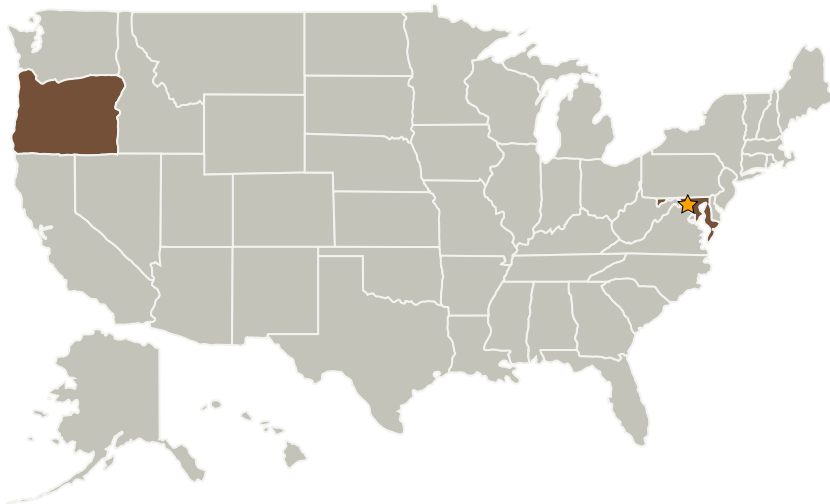
Completed Technology Project (2004 - 2004)



Project Introduction

Higher detection efficiency and better radiation tolerance imagers are needed for the next generation of EUV instruments. Previously, CCD technology has demonstrated EUV instability as well as degraded performance in radiation environments. Fortunately, CMOS imager technology has evolved to the stage that it is now feasible to fabricate multi-pixel arrays of diodes that can be absolutely calibrated and that are robust against radiation damage. CMOS sensors are less susceptible to radiation damage of the type that would disable entire regions of a CCD sensor. Nevertheless, the technology requires improved radiation tolerance. There currently does not exist a high performance, rad hard, EUV CMOS sensor. To address these needs, Voxel Inc. proposes to optimize the design of a radiation-hard, SOI CMOS back-illuminated EUV sensor with enhanced sensitivity and stable operation. The innovation's reduced optical cross section (app. 500nm) increases the imager's resolution, reduces radiation effects, and reduces the operating voltages required for silicon depletion. The ultra thin charge collection region is achieved through a novel, back-thinning method that offers superior manufacturability, stability, and reliability while maintaining compatibility with mainstream semiconductor fabrication processes. The low capacitance of SOI combined with our ultra-low noise amplifier design achieves previously unobtainable EUV imaging capabilities.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Voxtel, Inc.	Supporting Organization	Industry	Beaverton, Oregon

Primary U.S. Work Locations	
Maryland	Oregon

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

George A Williams

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes